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Title: Overview of Los Alamos National Laboratory

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Overview of Los Alamos National Laboratory

Larry Daughtery

**Associate Laboratory Directorate for Weapons Production,
Actinide Operations**

Michelle Mazanec
Veterans Recruiter



Los Alamos
NATIONAL LABORATORY



NNSA
National Nuclear Security Administration

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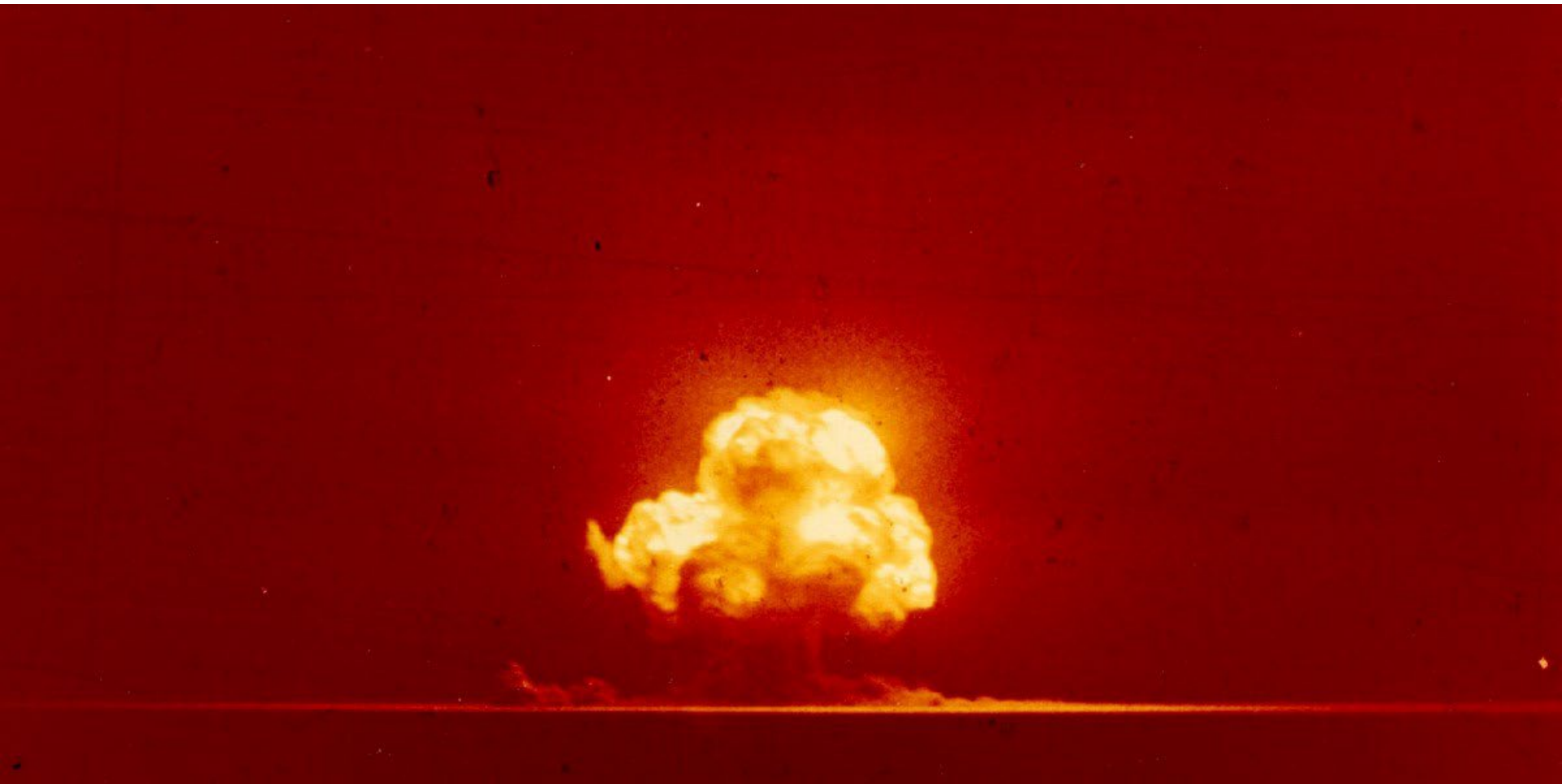
The main responsibility of the Los Alamos National Laboratory has always been to ensure our nation's safety through nuclear deterrence. We solve national security challenges through simultaneous excellence.



MG Leslie Groves and
Robert Oppenheimer



Lab Director Dr. Thom
Mason



July 16, 1945 - Trinity

Our Laboratory

By law, Los Alamos Director reports on the state and health of the Nation's deterrent



LANL's multidisciplinary
science and engineering
capability



21st century geopolitical realities are challenging the existing security/political/economic structures and institutions

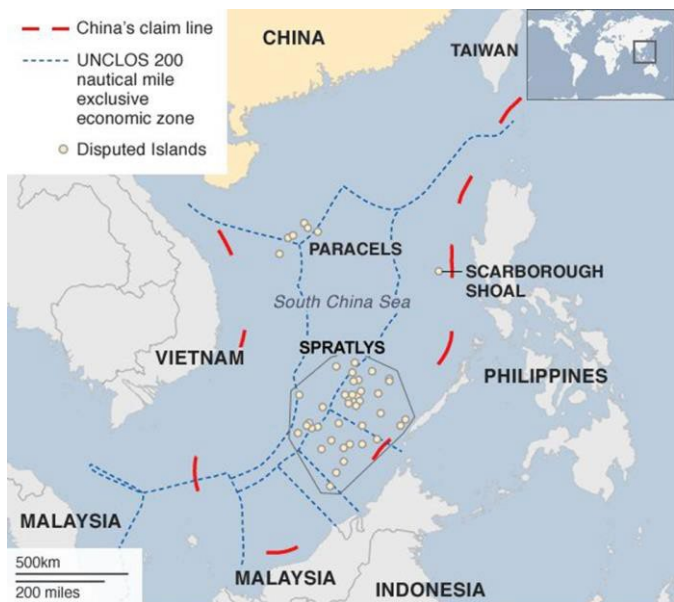
- Revanchist Russia
- Expansionist China
- Friend/foe North Korea ?
- Turmoil in Europe
- Chaos in Middle East
- Nuclear proliferation
- Terrorism/Cyber
- Resource competition



Iran's nuclear facilities



Source: New Scientist/ Global



Source: UNCLOS, CIA

BBC



How countries compare

	Pakistan	India
Population	173 million	1.2 billion
Religion	Mainly Muslims	Mainly Hindus
GDP per person	\$2,400	\$2,600
Life expectancy	63 (M), 65 (F)	67 (M), 72 (F)

Military Strength

Strategic balance between India and Pakistan:

Armed forces (troops)	INDIA	PAKISTAN
	1.3 million	610,000
Combat aircraft	886	340
Nuclear missiles	30-35	33-60
Surface warships	64	12
Submarines	16	5
Military spending	\$27 billion	\$5.2 billion

Geopolitical realities demand the Laboratory's excellence for solutions to national security

- 14,000 employees
 - 2500 PhDs
 - **1800 veterans**
 - 1800 summer students
- \$4B budget
- 36 square miles
- 47 technical areas
- 1,280 buildings / 9M sq. feet
 - 13 nuclear facilities
- 268 miles of roads (100 paved)



LANL is hiring 2000 new employees annually

LANL is *the* design agency for the majority of the Nation's on-alert deterrent

W76
W88

} US Navy

W78
B61

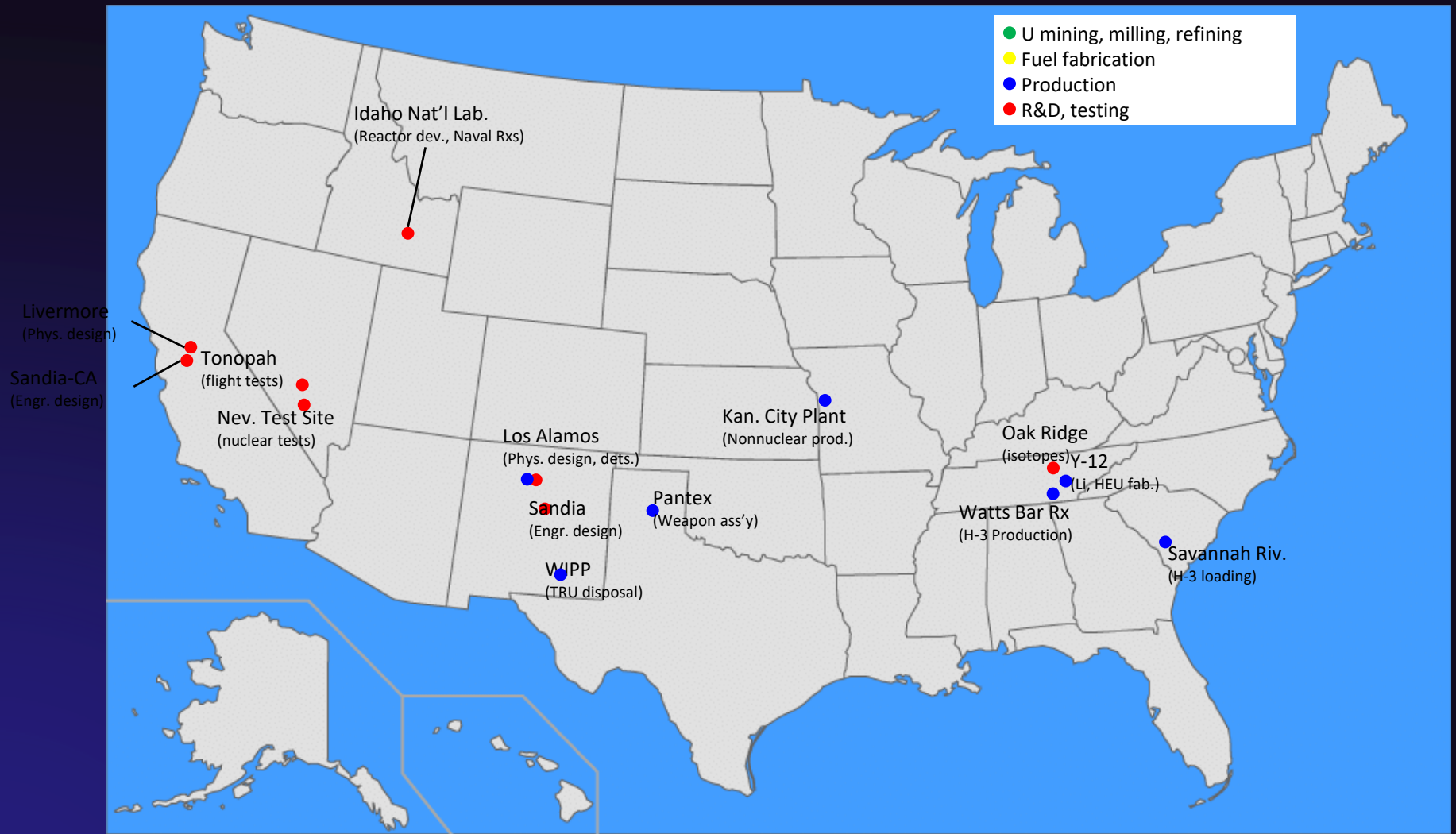
} US Air Force



“Nuclear weapons have and will continue to play a critical role in deterring nuclear attack and in preventing large scale conventional warfare between nuclear armed states...”

Former Secretary of Defense Jim Mattis, Nuclear Posture Review

The Current Nuclear Weapons Complex



Science, engineering and computation underpins all national security work of the laboratory

- **Experiments**

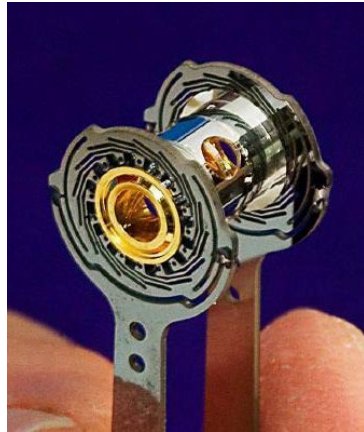
- 1000s of experiments conducted annually to further our understanding and confidence in the stockpile

- **Modeling and simulation**

- World class computing hardware/software

- **Designer judgement**

- Experimental data used to check judgement
- Train next generation



High Energy Density (HED)
Experiments



Large bore powder gun – measure
differences in performance of weapon
materials of interest



Petascale Supercomputing is critical to Los Alamos' national security missions

- Stockpile challenges are increasingly complex as systems continue to age
- DARHT, LANSCE, etc provide large data sets to resolve stockpile challenges
- Data sets require ever more capable machines that can quickly process information
- Capacity and Capability machines
 - Trinity (2015)
 - Crossroads (2022)

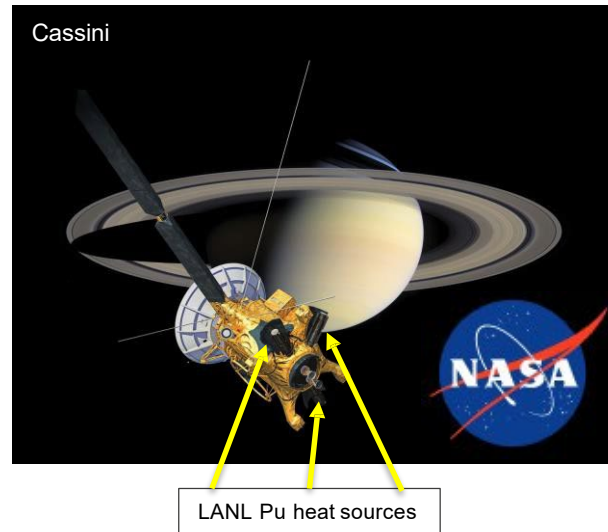
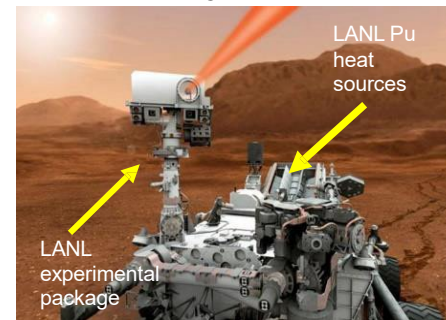


Los Alamos: center for plutonium excellence and critical to science and security

- Deliver parts for LANL experimental science
- Deliver parts for DoD Mission
 - 30 pits per year by 2026 (**opportunity for nuclear skilled service members**)
 - Partner with STRATCOM, Global Strike, USAF, USN.....
- Deliver parts for NASA and other federal agencies
- Provide technical options to meet new and emerging challenges
 - IAEA training
 - Nonproliferation / Counterproliferation / Counter Terrorism

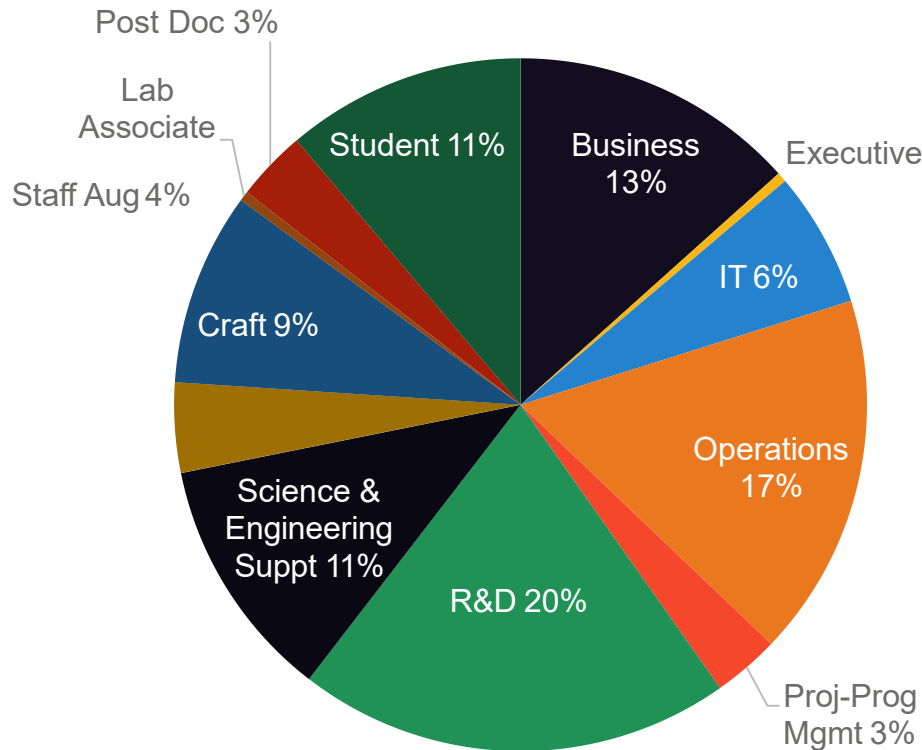


Mars Curiosity Rover

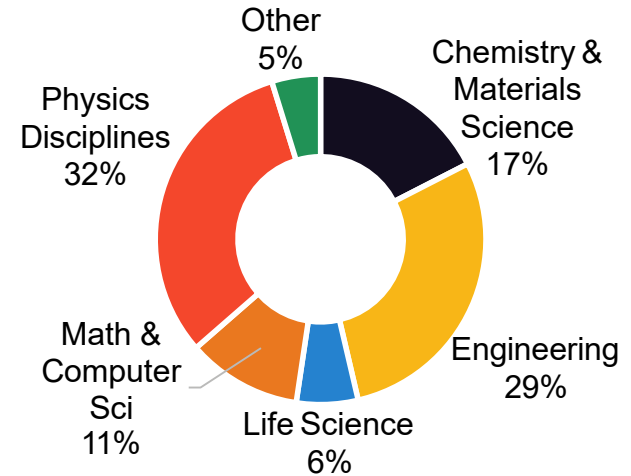


14,000 National Security specialists collaborate in a wide variety of technical disciplines

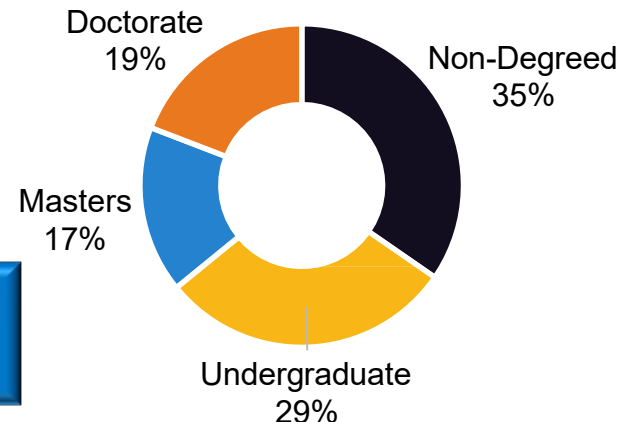
Employee Categories



R&D Employee Disciplines



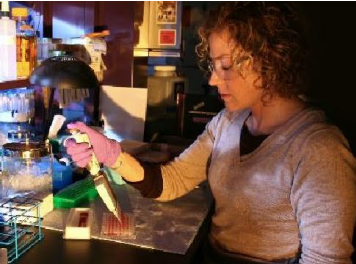
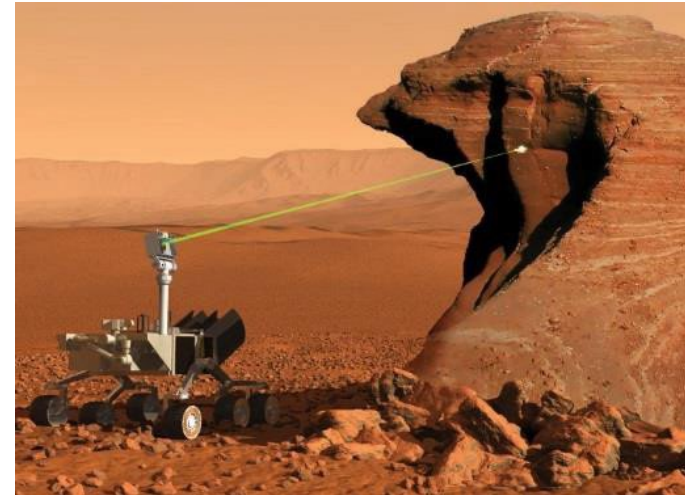
Degreed Workforce



Attracting and retaining a quality workforce is vitally important to the future of the Laboratory

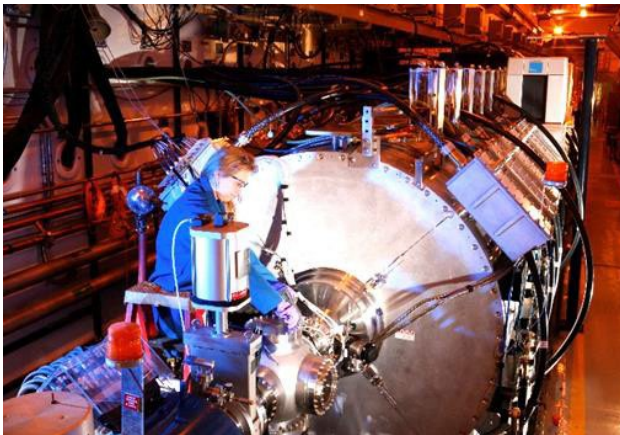
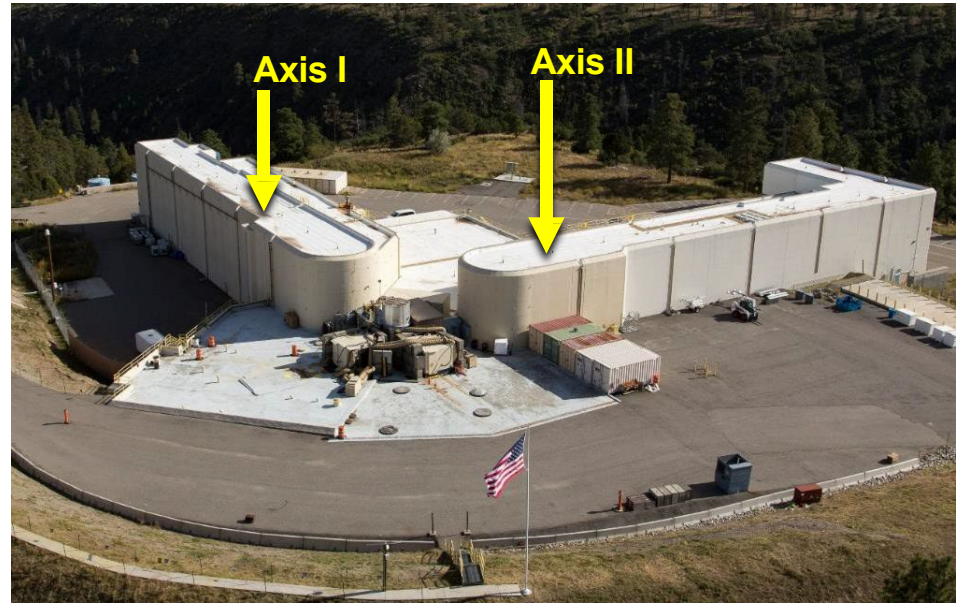
Today's Laboratory is delivering results for the Nation

- For 30 years the Stockpile Stewardship Program has ensured the safety and reliability of US nuclear weapons without full-scale testing
- The Trinity supercomputer is 40 times faster than the historic Roadrunner machine
- Non-proliferation and Counter-proliferation
- LANL scientists are exploring Mars (Perseverance Rover)
- Applied Energy Programs
- Medical isotopes
- LANL scientists are doing pioneering work in nanotechnology (CINT)



World class radiographic capabilities supports LANL/LLNL weapons and global security programs

- DARHT world-class X-ray radiography for non-nuclear tests
- Axis I: single image / Axis II: four images
- Experiments fully contained to reduce environmental impacts and increase shot rate





LANL is located on 36 square miles of DOE owned property
2,000+ facilities, 47 technical areas, 13 nuclear facilities, 268 miles of roads

We are hiring 2000+ new employees annually

Work-Life Balance at Los Alamos National Lab

Depending on the division, many employees work a 5/40, 9/80 (every other Friday off) or 4/10 (every Friday off) schedule allowing for time with family and pursuing recreational activities



Friday night concerts at Ashley Pond during the summer



Explore NM wildlife and eco-system at the Pajarito Environmental Education Center



Los Alamos High School is ranked #4 in New Mexico and #993 nationally

Recreational Activities abound in Los Alamos and Northern New Mexico

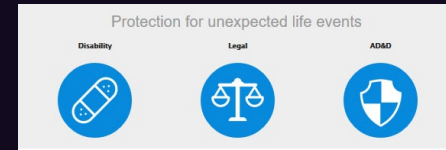
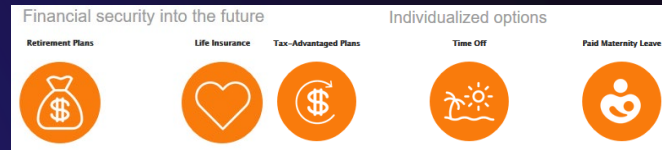
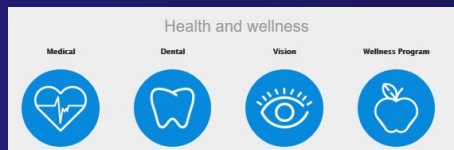


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Comprehensive benefits put LANL at the top: <https://www.lanl.gov/careers/employees-retirees/new-hires/benefit-options/index.php>



Questions?

Email: Michelle.C.Mazanec@lanl.gov or call 505-695-6975.